

JP 08245372 Capsule Agent

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CLAIMS

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[Claim(s)]

[Claim 1] The capsule which becomes considering acid-treatment gelatin and an agar as a coat basis.

[Claim 2] The capsule which becomes considering chemical modification gelatin and an agar as a coat basis. [Claim 3] The capsule which becomes considering acid-treatment gelatin, chemical modification gelatin, and an agar as a coat basis. [Claim 4] The capsule of the claim 2 which is the acid treatment or alkali-treatment gelatin from which chemical modification gelatin made one or more kinds chosen from among the succinic acid, the phthalic acid, and the acetic acid in the amino group of gelatin react, and was obtained, or a claim 3. [Claim 5] The capsule of the claims 1-4 which added the gelatin insolubilization inhibitor to the coat basis. [Claim 6] The capsule of the claim 5 whose gelatin insolubilization inhibitor is an organic acid. [Claim 7] The capsule of the claim 5 whose gelatin insolubilization inhibitor is amino acid. [Claim 8] The capsule of the claim 5 whose gelatin insolubilization inhibitor is a reducing agent. [Claim 9] The capsule of the claims 1-8 which it is mainly used as a medicine for external application, and twist a part of coat, are made to emit end contents at the time of use, and are used for it.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the capsule used for a drug, food, cosmetics, etc.

[0002]

[Description of the Prior Art] Generally, a capsule is formed by covering the quality of contents by the coat which makes gelatin a basis.

[0003] A capsule is promptly dissolved within the stomach by making gelatin into a basis, and in order to emit a content medicine at once, the manifestation of the effect of a medicine is early excellent in quick action. However, it becomes a problem, when anxious about a side effect by a medicine being emitted at once within the stomach, or when the effect of a medicine is asked for durability.

[0004] Moreover, for gelatin, the melting point is, when contents mainly make it the matter of high-melting points, such as hardened oil and a low, in an elastic capsule for a low reason. Since the gelatin gel film for coats dissolves at about 35 degrees C, contents cannot be warmed at the temperature beyond this, but a limit is received in contents, It dissolved in the bottom of heat and high humidity, and it adhered mutually and there were problems, such as starting a liquid spill.

[0005] Furthermore, since viscoelasticity of gelatin was strong, it was difficult to mainly be used for a medicine for external application, to have twisted a part of capsule at the time of use, and to have twisted in the elastic capsule which is generally called a self cut type, twist-off type, etc. and which emits and uses contents, when it softens according to moisture absorption etc.

[0006] To the above-mentioned sustained-release problem, the technology which blends an agar and a water soluble polymer with a coat is known. (JP,57-32230,A, JP,63-238015,A, JP,2-78612,A, JP,5-32543,A)

[0007]

[Problem(s) to be Solved by the Invention] However, since the alkali-treatment gelatin usually used for a capsule does not dissolve in an agar and completeness, the obtained capsule does not have gelatin and the property of both agars, as expected not necessarily. Moreover, the solution for capsule coats which dissolved these is separated with time, and it is difficult for quality to obtain a fixed capsule continuously, and has come to solve the above-mentioned technical problem actually.

[0008] There was a problem which causes insolubilization of a coat still with time and a decay time extends gradually.

[0009] By manufacturing the stable coat possessing the property of original of an agar and gelatin, the invention in this application is made in order to solve the above-mentioned fault of the mixed coat of an agar and gelatin.

[0010]

[Means for Solving the Problem] The invention-in-this-application person found out that it was effective to blend gelatin insolubilization inhibitors, such as to make all or a part of gelatin material into chemical modification gelatin and an organic acid, amino acid, and a reducing agent, in order to prevent using acid-treatment gelatin, chemical modification gelatin, or both mixture for the gelatin which repeats

research about the agar and alkali-treatment gelatin which are usually used, and is mixed, and that the obtained capsule insolubilizes with time. It is the capsule which an agar and gelatin dissolved the capsule concerning the invention in this application completely, and did not dissociate with time, but had gelatin and the special feature of both agars, and the quality which a decay time does not extend [ a coat ] with time offers a fixed capsule.

[0011] The acid-treatment gelatin said here means the gelatin which understood the collagen which is the raw material of gelatin an added water part, and extracted it by acid matter, such as dilute hydrochloric acid and a dilute sulfuric acid, and it differs from the alkali-treatment gelatin which understood the collagen an added water part and extracted it by alkaline matter, such as lime liquid. Usually, in a capsule, alkali-treatment gelatin is used on exterior problems, like there are few degrees of coloring with mainly high transparency, or a reactant problem with a contents medicine.

[0012] On the other hand, although what the amino group of gelatin and various matter were made to react, said that to which the property of gelatin was changed, was made to react with a succinic acid, a phthalic acid, an acetic acid, etc., and was manufactured is common as for chemical modification gelatin, it is not limited to this. Moreover, if it is chemical modification gelatin, what does not need to be acid-treatment gelatin and carried out chemical modification of the alkali-treatment gelatin can be used. Although especially a limit does not have any gelatin in the physical properties, in order to manufacture with a well-known capsule manufacture machine conventionally, the thing of the 150 to jelly-strength 300 bloom is desirable.

[0013] Cautions are required, in order that mixed liquor may nebula-ize mixing and using the acid-treatment gelatin and chemical modification gelatin by which chemical modification is not carried out depending on the ratio to mix, when chemical modification gelatin is alkali-treatment gelatin, although mixing by what ratio satisfactory is also possible when chemical modification gelatin is acid-treatment gelatin. As for the ratio of the acid-treatment gelatin in this case, and alkali-treatment ornamentation gelatin, 40:60-60:40 are desirable. However, since there is an inclination for nebula-ization to become strong when both of the gelatin exceeds 50%, it is 50:50 more preferably.

[0014] Like a sustained-release capsule, although there is no limit, the agar of the high intensity more than 400g [ /cm ] jelly-strength 2 (Japanese \*\*\*\* type) is desirable, and especially the kind of agar to mix has it also in a two or less jelly-strength 200 g/cm hydrolysis agar, when the film strength of a capsule is required. [ usable for the other use ]

[0015] The mixed ratio of an agar and gelatin is not limited that what is necessary is just to especially choose suitably for the purpose and use. For example, it is effective 5% or more of for a self cut type capsule to twist the ratio of gelatin and the agar in mixture of an agar 15% or more, in order to obtain a sustained-release capsule 5% or more, and to make end nature improve, in order to make collapsibility extend, in order to raise the thermal resistance at the time of processing of a capsule, or preservation 20% or more and to prevent the adhesion of capsules 1% or more.

[0016] In an organic acid, amino acid, a reducing agent, etc., a gelatin insolubilization inhibitor will not be limited, especially if soluble degradation of good gelatin with time is prevented. There are specifically a fumaric acid, a tartaric acid, a citric acid, a hydrochloric acid, etc. as an organic acid, and, specifically, there are an arginine, a glycine, an aspartic acid, etc. as amino acid. The reducing agent said here is a component which insolubilizes gelatin with time, and the component which reforms the property of reducing sugars, such as a \*\*\*\*\* rare \*\* galactose and a xylose, in an agar is said. Specifically, there are hydrogen iodide, a hydrogen sulfide, a sulfur dioxide, a sulfite, etc. These insolubilization inhibitors act effectively with independent or combination. In the case of [ 0.05% - about 1% of ] the sodium sulfite they are 0.5 - 4%, and a reducing agent in the case of [ whose ] the aspartic acid they are 0.5 - 5%, and amino acid in the case of [ whose ] the citric acid which is an organic acid as opposed to the solid-content weight of an agar and gelatin mixture, it is good, although it cannot limit, especially since loadings change with matter to blend.

[0017] the capsule of this invention -- a hard gelatin capsule, a soft capsule, and a microcapsule -- the manufacture method of a conventional method can be used also in any, and various kinds of capsules can be obtained For example, the forming pin dip coating as a hard-gelatin-capsule manufacturing

method, the rotary method as a soft capsule manufacturing method, a dropping test, the coacervation method as a microcapsule manufacturing method, etc. can use it effectively. Moreover, into the contents of a capsule, and a coat, additives, such as a plasticizer, a coloring agent, antiseptics, a corrigent, and an emulsifier, can be blended conventionally like a well-known capsule.

[0018]

[Example] Among the capsules concerning this invention, the example of comparative experiments is given to below, and an elastic capsule is explained to it in detail. It does not pass over these to an example of this invention, and they are not limited to these.

[0019] 1. Mixed preparation of the raw material as shown in the sample table 1 was carried out, and the solution for soft capsule coats of the examples 1-2 of comparison and examples 1-6 was prepared. Subsequently, this solution for soft capsule coats was taught to the rotary system soft capsule manufacture machine by the liner company, and the oval 5 type (it is the same the ellipse sphere type capsule generally used and the following) elastic capsule which used contents as the liquid paraffin was manufactured.

[0020]

[Table 1] Loadings of the solution for capsule coats of the examples 1-2 of comparison with which each

単位 = 重量部

	比較例1	比較例2	実施例1	実施例2	実施例3	実施例4	実施例5	実施例6
アルカリ処理ゼラチン	100	80	—	—	—	—	—	—
食塩ゼラチン	—	—	90	85	80	—	40	30
コハク化ゼラチン	—	—	—	—	—	80	40	—
寒天	—	20	10	15	20	20	20	20
アスパラギン酸	—	—	—	—	—	—	—	2
グリセリン	30	30	30	30	30	30	30	30
精製水	120	120	120	120	120	120	120	120

experiment is presented, and examples 1-6.

2. Capsule Manufactured Using Solution for Soft Capsule Coats of Examples 1-2 of Disintegration-Test Comparison, and Examples 1-6, the inside of the disintegration-test machine of the Pharmacopoeia of Japan convention of what put this sample at a time into ten glass sample bottles, sealed it, and was saved for three months in the 40-degree C thermostat -- putting in -- the [ a 36-degree C purified water, the first liquid (PH 1.2 / about /) of the Pharmacopoeia of Japan, and ] -- dissolution time was measured in 2 liquid (PH 6.8 [ about ]) The result is shown in Table 2.

[0021]

	崩壊時間 (分) n=6					
	保存前			保存後		
試験液	精製水	第一液	第二液	精製水	第一液	第二液
比較例1	9.7	9.6	9.7	11.0	10.9	10.5
比較例2	25.9	24.8	25.1	60<	60<	60<
実施例1	35.4	36.2	35.8	60<	60<	60<
実施例2	41.0	43.1	41.5	60<	60<	60<
実施例3	52.8	56.6	52.5	60<	60<	60<
実施例4	53.1	54.2	53.4	54.5	53.3	54.0
実施例5	52.7	52.6	52.7	53.0	53.3	52.9
実施例6	53.2	54.3	52.9	55.4	56.3	54.8

[Table 2] The result of a disintegration test.

It turns out also in the example 3 with the example 2 of comparison of a conventional method and the loadings of an agar same [ the capsule by this invention ] that the extended effect of a decay time does not depend for the collapsibility on PH by seeing notably so that more clearly than Table 2. Discovering fixed collapsibility is suggested without being influenced by the state of various PHs in the living body from this.

[0022] Moreover, the experimental result of examples 1, 2, and 3 showed that the collapsibility of a capsule was dependent on the loadings of acid-treatment gelatin and an agar. Therefore, a decay time can adjust arbitrarily with the loadings. Moreover, in the examples 4 and 5 and the example 6 which is the sample which blended the aspartic acid which is a sample using the gelatin by which chemical modification was carried out by the succinic acid, extension of the with-time decay time after preservation is not seen compared with preservation before. Therefore, it is not influenced by PH in the living body, but a decay time can be set up arbitrarily, and the capsule which a decay time does not extend with time is made possible, and it is especially suitable for the capsule as an oral drug etc.

[0023] 3. the state where put ten capsules of the examples 1-2 of adhesion test comparison, and an example 3 at a time into the glass sample bottle, and opening of the mouth of a bottle was carried out -- the constant temperature of 40 degrees C and 70%RH -- after saving in the constant humidity chamber for 24 hours and returning to a room temperature, this sample bottle was changed into the following states, and the adhesion of each sample was judged by the number of the elastic capsule which fell

[0024] (a) Make a sample bottle reverse calmly.

[0025] (b) Make the sample bottle after an examination of a reverse calmly, and drop it from 1cm on a desk.

[0026] (c) Make the sample bottle after an examination of b reverse calmly, and drop it from 3cm on a desk.

[0027] (d) Make the sample bottle after an examination of c reverse calmly, and drop it from 5cm on a

desk.

[0028] A result is shown in Table 3.

[0029]

[Table 3] The result of an adhesion examination.

	サンプル瓶から落下したカプセルの果積数 (個)			
	逆さに する	机上 1 cm から 落とす	机上 3 cm から 落とす	机上 5 cm から 落とす
比較例 1	0	0	0	0
比較例 2	0	2	8	6
実施例 3	3	9	10	—

The capsule which starts this invention so that clearly from Table 3 has the property which was excellent as a capsule that capsules cannot adhere easily in the preservation under heat and high humidity compared with the conventional capsule.

[0030] 4. It twisted, the solution for soft capsule coats of the examples 1-2 of end test comparison and an example 3 was taught to the rotary system soft capsule manufacture machine by the liner company in a self cut type capsule which changed metal mold into the self cut type from the oval 5 type, and contents manufactured the self cut type capsule of a liquid paraffin by the conventional method. the \*\* which puts this self cut type capsule and this sample at a time into ten glass sample bottles, and does not carry out a plug -- the constant temperature of 30 degrees C and 75%RH -- it had twisted the neck at a time five capsules of each about the self cut type capsule saved in the constant humidity chamber for 24 hours, and five persons' panelist performed the examination which usually gives the score of one point of defects 2 point three points of fitness by the ease of cutting by twisting A result is shown in Table 4.

[0031]

[Table 4] It is a result to the twist end examination in a self cut type capsule.

		バレル1	バレル2	バレル3	バレル4	バレル5	合計
比較例1	保存前	2	2	2	3	2	11
	保存後	1	1	1	1	1	5
比較例2	保存前	2	2	3	3	2	12
	保存後	1	1	2	2	1	7
実施例3	保存前	3	3	3	3	3	15
	保存後	3	2	3	2	2	12

The capsule by this invention was clearly twisted as compared with it of a conventional method, end nature was good, and when it was saved under heat and high humidity, the effect was similarly confirmed, so that clearly from Table 4.

[0032] 5. warming -- the solution for soft capsule coats of the examples 1-2 of contents restoration test comparison, and an example 3 -- the rotary system soft capsule manufacture machine by the liner company -- teaching -- contents -- warming of rapeseed partial hardened oil (40 degrees C of melting points) -- as a melt (temperature of 50 degrees C), after manufacturing an oval 5 type elastic capsule,

these 20 capsules were observed visually and the defect was questioned A result is shown in Table 5.

[0033]

[Table 5] warming -- the result of a contents restoration examination

	不良数 (個) n = 20		
検 体	液漏れ	変形	付着
比較例1	20	20	8
比較例2	7	19	8
実施例3	0	0	0

According to the capsule of this invention, in the conventional method, capsule processing was possible also for the contents maintained at the impossible elevated temperature the passage clear from Table 5, without starting deformation, a liquid spill, etc.

[0034]

[Effect of the Invention] Thus, the invention in this application enables adjustment of the solution for capsule coats with which conventionally difficult an agar and gelatin were made to mix completely, it is the stable capsule which fully had the agar and the property of the both sides of gelatin, and the capsule which not only the thing for which arbitrary collapsibility is given with the loadings of gelatin and an agar but also the features of gelatin and an agar adjusts arbitrarily, and has the property of hope can be offered.

[0035] therefore -- arbitrary -- the durability of the effect of a medicine -- giving -- warming -- realization of the elastic capsule of the heat-and-high-humidity-proof nature which can be adapted also for contents was enabled

[0036] Since it has the brittleness of an agar, and the viscoelasticity of gelatin also in a self cut type capsule, it is the good thing which can twist, can obtain end nature and raises the convenience of this type of capsule.

[0037] Moreover, since the collapsibility has with time the feature that it is fixed and quality cannot change easily, the optimal collapsibility can be set up to the use of contents, and the purpose.

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TECHNICAL FIELD

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[Industrial Application] this invention relates to the capsule used for medical supplies, food, cosmetics, etc.

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EFFECT OF THE INVENTION

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[Effect of the Invention] Thus, the invention in this application enables adjustment of the solution for capsule coats with which conventionally difficult an agar and gelatin were made to mix completely, it is the stable capsule which fully had the agar and the property of the both sides of gelatin, and the capsule which not only the thing for which arbitrary collapsibility is given with the loadings of gelatin and an agar but also the features of gelatin and an agar adjusts arbitrarily, and has the property of hope can be offered.

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TECHNICAL PROBLEM

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[Description of the Prior Art] Generally, a capsule is formed by covering the quality of contents by the coat which makes gelatin a basis.

[0003] A capsule is promptly dissolved within the stomach by making gelatin into a basis, and in order to emit a contents medicine at once, the manifestation of the effect of a medicine is early excellent in quick action. However, it becomes a problem, when anxious about a side effect by a medicine being emitted at once within the stomach, or when the effect of a medicine is asked for durability.

[0004] Moreover, gelatin is, when contents mainly make it the matter of high-melting points, such as hardened oil and a low, in an elastic capsule, since the melting point is low. Since the gelatin gel film for coats dissolves at about 35 degrees C, contents cannot be warmed at the temperature beyond this, but a limit is received in contents, It dissolved in the bottom of heat and high humidity, and it adhered mutually and there were problems, such as starting a liquid spill.

[0005] Furthermore, since viscoelasticity of gelatin was strong, it was difficult to mainly be used for a medicine for external application, to have twisted a part of capsule at the time of use, and to have twisted in the elastic capsule which is generally called a self cut type, twist-off type, etc. and which emits and uses contents, when it softens according to moisture absorption etc.

[0006] To the above-mentioned sustained-release problem, the technology which blends an agar and a water soluble polymer with a coat is known. (JP,57-32230,A, JP,63-238015,A, JP,2-78612,A, JP,5-32543,A)

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## MEANS

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[Means for Solving the Problem] The invention-in-this-application person found out that it was effective to blend gelatin insolubilization inhibitors, such as to make all or a part of gelatin material into chemical modification gelatin and an organic acid, amino acid, and a reducing agent, in order to prevent using acid-treatment gelatin, chemical modification gelatin, or both mixture for the gelatin which repeats research about the agar and alkali-treatment gelatin which are usually used, and is mixed, and that the obtained capsule insolubilizes with time. It is the capsule which an agar and gelatin dissolved the capsule concerning the invention in this application completely, and did not dissociate with time, but had gelatin and the special feature of both agars, and the quality which a decay time does not extend [ a coat ] with time offers a fixed capsule.

[0011] The acid-treatment gelatin said here means the gelatin which understood the collagen which is the raw material of gelatin an added water part, and extracted it by acid matter, such as dilute hydrochloric acid and a dilute sulfuric acid, and it differs from the alkali-treatment gelatin which understood the collagen an added water part and extracted it by alkaline matter, such as lime liquid. Usually, in a capsule, alkali-treatment gelatin is used on exterior problems, like there are few degrees of coloring with mainly high transparency, or a reactant problem with a contents medicine.

[0012] On the other hand, although what the amino group of gelatin and various matter were made to react, said that to which the property of gelatin was changed, was made to react with a succinic acid, a phthalic acid, an acetic acid, etc., and was manufactured is common as for chemical modification gelatin, it is not limited to this. Moreover, if it is chemical modification gelatin, what does not need to be acid-treatment gelatin and carried out chemical modification of the alkali-treatment gelatin can be used. Although especially a limit does not have any gelatin in the physical properties, in order to manufacture with a well-known capsule manufacture machine conventionally, the thing of the 150 to jelly-strength 300 bloom is desirable.

[0013] Cautions are required, in order that mixed liquor may nebula-ize mixing and using the acid-treatment gelatin and chemical modification gelatin by which chemical modification is not carried out depending on the ratio to mix, when chemical modification gelatin is alkali-treatment gelatin, although mixing by what ratio satisfactory is also possible when chemical modification gelatin is acid-treatment gelatin. As for the ratio of the acid-treatment gelatin in this case, and alkali-treatment ornamentation gelatin, 40:60-60:40 are desirable. However, since there is an inclination for nebula-ization to become strong when both of the gelatin exceeds 50%, it is 50:50 more preferably.

[0014] Like a sustained-release capsule, although there is no limit, the agar of the high intensity more than 400g [ /cm ] jelly-strength 2 (Japanese \*\*\*\* type) is desirable, and especially the kind of agar to mix has it also in a two or less jelly-strength 200 g/cm hydrolysis agar, when the film strength of a capsule is required. [ usable for the other use ]

[0015] The mixed ratio of an agar and gelatin is not limited that what is necessary is just to especially choose suitably for the purpose and use. For example, it is effective 5% or more of for a self cut type capsule to twist the ratio of gelatin and the agar in mixture of an agar 15% or more, in order to obtain a sustained-release capsule 5% or more, and to make end nature improve, in order to make collapsibility

extend, in order to raise the thermal resistance at the time of processing of a capsule, or preservation 20% or more and to prevent the adhesion of capsules 1% or more.

[0016] In an organic acid, amino acid, a reducing agent, etc., a gelatin insolubilization inhibitor will not be limited, especially if soluble degradation of good gelatin with time is prevented. There are specifically a fumaric acid, a tartaric acid, a citric acid, a hydrochloric acid, etc. as an organic acid, and, specifically, there are an arginine, a glycine, an aspartic acid, etc. as amino acid. The reducing agent said here is a component which insolubilizes gelatin with time, and the component which reforms the property of reducing sugars, such as a \*\*\*\*\* rare \*\* galactose and a xylose, in an agar is said. Specifically, there are hydrogen iodide, a hydrogen sulfide, a sulfur dioxide, a sulfite, etc. These insolubilization inhibitors act effectively with independent or combination. In the case of [ 0.05% - about 1% of ] the sodium sulfite they are 0.5 - 4%, and a reducing agent in the case of [ whose ] the aspartic acid they are 0.5 - 5%, and amino acid in the case of [ whose ] the citric acid which is an organic acid as opposed to the solid-content weight of an agar and gelatin mixture, it is good, although it cannot limit, especially since loadings change with matter to blend.

[0017] the capsule of this invention -- a \*\* capsule, a soft capsule, and a microcapsule -- the manufacture method of a conventional method can be used also in any, and various kinds of capsules can be obtained For example, the forming pin dip coating as a \*\* capsule manufacturing method, the rotary method as a soft capsule manufacturing method, a dropping test, the coacervation method as a microcapsule manufacturing method, etc. can use it effectively. Moreover, into the contents of a capsule, and a coat, additives, such as a plasticizer, a coloring agent, antiseptics, a corrigent, and an emulsifier, can be blended conventionally like a well-known capsule.

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## EXAMPLE

[Example] Among the capsules concerning this invention, the example of comparative experiments is given to below, and an elastic capsule is explained to it in detail. It does not pass over these to an example of this invention, and they are not limited to these.

[0019] 1. Mixed preparation of the raw material as shown in the sample table 1 was carried out, and the solution for soft capsule coats of the examples 1-2 of comparison and examples 1-6 was prepared. Subsequently, this solution for soft capsule coats was taught to the rotary system soft capsule manufacture machine by the liner company, and the oval 5 type (it is the same the ellipse sphere type capsule generally used and the following) elastic capsule which used contents as the liquid paraffin was manufactured.

[0020]

[Table 1] Loadings of the solution for capsule coats of the examples 1-2 of comparison with which each

単位=重量部

	比較例1	比較例2	実施例1	実施例2	実施例3	実施例4	実施例5	実施例6
アルカリ処理ゼラチン	100	80	—	—	—	—	—	—
酸処理ゼラチン	—	—	90	85	80	—	40	80
コハク化ゼラチン	—	—	—	—	—	80	40	—
系天	—	20	10	15	20	20	20	20
アスパラギン酸	—	—	—	—	—	—	—	2
グリセリン	30	30	30	30	30	30	30	30
精製水	120	120	120	120	120	120	120	120

experiment is presented, and examples 1-6.

2. Capsule Manufactured Using Solution for Soft Capsule Coats of Examples 1-2 of Decay Test Comparison, and Examples 1-6, the inside of the decay tester of the Pharmacopoeia of Japan convention of what put this sample at a time into ten glass sample bottles, sealed it, and was saved for three months in the 40-degree C thermostat -- putting in -- the [ a 36-degree C purified water, the first liquid (PH 1.2 / about /) of the Pharmacopoeia of Japan, and ] -- dissolution time was measured in 2 liquid (PH 6.8 [ about ]) The result is shown in Table 2.

[0021]

	崩壊時間 (分) n=6					
	保存前			保存後		
試験液	精製水	第一液	第二液	精製水	第一液	第二液
比較例 1	9.7	9.6	9.7	11.0	10.9	10.5
比較例 2	25.3	24.8	25.1	60<	60<	60<
実施例 1	35.4	36.2	35.8	60<	60<	60<
実施例 2	41.0	43.1	41.5	60<	60<	60<
実施例 3	52.9	56.6	52.5	60<	60<	60<
実施例 4	53.1	54.2	53.4	54.5	58.3	54.0
実施例 5	52.7	52.6	52.7	53.0	53.3	52.9
実施例 6	53.2	54.3	52.9	55.4	56.3	54.8

[Table 2] The result of a decay examination.

It turns out also in the example 3 with the example 2 of comparison of a conventional method and the loadings of an agar same [ the capsule by this invention ] that the extended effect of a decay time does not depend for the collapsibility on PH by seeing notably so that more clearly than Table 2. Discovering fixed collapsibility is suggested without being influenced by the state of various PHs in the living body from this.

[0022] Moreover, the experimental result of examples 1, 2, and 3 showed that the collapsibility of a capsule was dependent on the loadings of acid-treatment gelatin and an agar. Therefore, a decay time can adjust arbitrarily with the loadings. Moreover, in the examples 4 and 5 and the example 6 which is the sample which blended the aspartic acid which is a sample using the gelatin by which chemical modification was carried out by the succinic acid, extension of the with-time decay time after preservation is not seen compared with preservation before. Therefore, it is not influenced by PH in the living body, but a decay time can be set up arbitrarily, and the capsule which a decay time does not extend with time is made possible, and it is especially suitable for the capsule as oral medical supplies etc.

[0023] 3. the state where put ten capsules of the examples 1-2 of adhesion test comparison, and an example 3 at a time into the glass sample bottle, and opening of the mouth of a bottle was carried out -- the constant temperature of 40 degrees C and 70%RH -- after saving in the constant humidity chamber for 24 hours and returning to a room temperature, this sample bottle was changed into the following states, and the adhesion of each sample was judged by the number of the elastic capsule which fell

[0024] (a) Make a sample bottle reverse calmly.

[0025] (b) Make the sample bottle after an examination of a reverse calmly, and drop it from 1cm on a desk.

[0026] (c) Make the sample bottle after an examination of b reverse calmly, and drop it from 3cm on a desk.

[0027] (d) Make the sample bottle after an examination of c reverse calmly, and drop it from 5cm on a desk.

[0028] A result is shown in Table 3.

[0029]

[Table 3] The result of an adhesion examination.

	サンプル瓶から落下したカプセルの累積数 (個)			
	逆さに する	机上 1 cm から 落とす	机上 3 cm から 落とす	机上 5 cm から 落とす
比較例 1	0	0	0	0
比較例 2	0	2	8	6
実施例 3	3	9	10	—

The capsule which starts this invention so that clearly from Table 3 has the property which was excellent as a capsule that capsules cannot adhere easily in the preservation under heat and high humidity compared with the conventional capsule.

[0030] 4. It twisted, the solution for soft capsule coats of the examples 1-2 of end test comparison and an example 3 was taught to the rotary system soft capsule manufacture machine by the liner company in a self cut type capsule which changed metal mold into the self cut type from the oval 5 type, and contents manufactured the self cut type capsule of a liquid paraffin by the conventional method. the \*\* which puts this self cut type capsule and this sample at a time into ten glass sample bottles, and does not carry out a plug -- the constant temperature of 30 degrees C and 75%RH -- the self cut type capsule saved in the constant humidity chamber for 24 hours -- a by [ each 5 capsules ] neck -- twisting -- cutting -- the -- it twists and good by the ease of cutting -- five persons' panelist usually performed the examination which gives the score of one point of defects 2 point 3 point A result is shown in Table 4.

[0031]

[Table 4] It is a result to the twist end examination in a self cut type capsule.

		パネル1	パネル2	パネル3	パネル4	パネル5	合計
比較例1	保存前	2	2	2	3	2	11
	保存後	1	1	1	1	1	5
比較例2	保存前	2	2	3	3	2	12
	保存後	1	1	2	2	1	7
実施例3	保存前	3	3	3	3	3	15
	保存後	3	2	3	2	2	12

The capsule by this invention was clearly twisted as compared with it of a conventional method, end nature was good, and when it was saved under heat and high humidity, the effect was similarly confirmed, so that clearly from Table 4.

[0032] 5. warming -- the solution for soft capsule coats of the examples 1-2 of contents restoration test comparison, and an example 3 -- the rotary system soft capsule manufacture machine by the liner company -- teaching -- contents -- warming of NATANE partial hardened oil (40 degrees C of melting

points) -- as a melt (temperature of 50 degrees C), after manufacturing an oval 5 type elastic capsule, these 20 capsules were observed visually and the defect was questioned A result is shown in Table 5.

[0033]

[Table 5] warming -- the result of a contents restoration examination

	不良数 (個)    n = 20		
検 体	液漏れ	変形	付着
比較例 1	20	20	8
比較例 2	7	13	8
実施例 3	0	0	0

According to the capsule of this invention, in the conventional method, capsule processing was possible also for the contents maintained at the impossible elevated temperature the passage clear from Table 5, without starting deformation, a liquid spill, etc.

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[Translation done.]



\* NOTICES \*

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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( Writing book + Summary + The range of a claim )

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(57) [Abstract]

[Objects of the Invention] Adjustment of the solution for capsule coats with which conventionally difficult an agar and gelatin were made to mix completely is enabled, and the stable capsule which fully had the agar and the property of the both sides of gelatin is offered.

[Elements of the Invention] Acid-treatment gelatin, chemical modification gelatin, the capsule that becomes considering the combination of an agar as a coat basis.

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[Claim(s)]

[Claim 1] The capsule which becomes considering acid-treatment gelatin and an agar as a coat basis.

[Claim 2] The capsule which becomes considering chemical modification gelatin and an agar as a coat basis. [Claim 3] The capsule which becomes considering acid-treatment gelatin, chemical modification gelatin, and an agar as a coat basis. [Claim 4] The capsule of the claim 2 which is the acid treatment or alkali-treatment gelatin from which chemical modification gelatin made one or more kinds chosen from among the succinic acid, the phthalic acid, and the acetic acid in the amino group of gelatin react, and was obtained, or a claim 3. [Claim 5] The capsule of the claims 1-4 which added the gelatin insolubilization inhibitor to the coat basis. [Claim 6] The capsule of the claim 5 whose gelatin insolubilization inhibitor is an organic acid. [Claim 7] The capsule of the claim 5 whose gelatin insolubilization inhibitor is amino acid. [Claim 8] The capsule of the claim 5 whose gelatin insolubilization inhibitor is a reducing agent. [Claim 9] The capsule of the claims 1-8 which it is mainly used as a medicine for external application, and twist a part of coat, are made to emit end contents at the time of use, and are used for it.

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[Translation done.]

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